Schlatter's disease. An important feature is the large number of new words with which the medical vocabulary has been enriched during the last few years. The book contains such new words as anoci-association, biometer, colliculectomy, gassed, keritherapy, leukotoxic, serobacterins, sympathoblasts, etc.

This handy, practical book, in octavo size, 1¼ inches thick, containing nearly 71,000 words, is unique among modern dictionaries and can not fail to receive a hearty welcome by the medical practitioner and the student of medicine.

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PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES

(VOLUME 2, NUMBER 5)

THE fifth number of Volume 2 of the *Proceedings of the National Academy of Sciences* contains the following articles:

1. *The High Frequency Spectrum of Tungsten:* ALBERT W. HULL and MARION RICE, Research Laboratory, General Electric Company.

The authors show two photographs of the spectrum of X-rays taken in the usual manner in a rock-salt crystal. They also give figures which show the ionization current as a function of the angle of incidence. A comparison with previous results obtained by others is sketched.

2. *On the Foundations of Plane Analysis Situs:* ROBERT L. MOORE, Department of Mathematics, University of Pennsylvania.

As point, limit-point and regions (of certain types) are fundamental in analysis situs, the author has set up two systems of postulates for plane analysis situs based upon these notions; each set is sufficient for considerable body of theorems.

3. *A General Theory of Surfaces:* EDWIN B. WILSON and C. L. E. MOORE, Department of Mathematics, Massachusetts Institute of Technology.

Continuing the work of Kommerell, Levi and Segre, a theory of two-dimensional surfaces in n-dimensional space is developed by the method of analysis outlined by Ricci in his absolute differential calculus.

4. *Dynamical Stability of Aeroplanes:* JEROME C. HUNSAKER, U. S. Navy and Massachusetts Institute of Technology.

A comparative detailed study of two aeroplanes, one a standard military tractor, the other designed for inherent stability, is made for the purpose of reaching general conclusions of a practical nature with respect to aeroplane design. It appears that inherent stability (except at low speed) can be obtained by careful design without departing seriously from the standard type now in use.

5. *Cliffed Islands in the Coral Seas:* W. M. DAVIS, Department of Geology and Geography, Harvard University.

The author extends his former work on the Origin of Coral Reefs to include the explanation of the cliffs of exceptional reef-encircled islands of which no adequate explanation has previously been given.

6. *On Some Relations between the Proper Motions, Radial Velocities and Magnitudes of Stars of Classes B and A:* C. D. PERRINE, Observatorio Nacional Argentino, Cordoba.

The velocity distribution of classes *B*–*B*5 and *A* differ from the distributions found for the *F*, *G*, *K* and *M* classes by Kapteyn and Adams.

7. *Asymmetry in the Proper Motions and Radial Velocities of Stars of Class B and Their Possible Relation to a Motion of Rotation:* C. D. PERRINE, Observatorio Nacional Argentino, Cordoba.

Stars of class *B* show differences in the proper motions in the two regions of the Milky Way at right angles to the direction of solar motion; the differences appear to be best explained by a general motion of rotation of the system of stars in a retrograde direction about an axis perpendicular to the Milky Way.

8. *Theory of an Aeroplane Encountering Gusts:* EDWIN BIDWELL WILSON, Department of Mathematics, Massachusetts Institute of Technology.

The longitudinal motion of an aeroplane encountering head-on, vertical, or rotary gusts is discussed by the method of small oscillations.

An inherently stable machine striking a head gust of J feet per second soars to altitude of about $4\frac{1}{2}$ J feet above its initial level and, after executing oscillations, remains about $3\frac{1}{2}$ J feet above the original level.

9. *Terms of Relationship and Social Organization:* TRUMAN MICHELSON, Bureau of American Ethnology, Washington, D. C.

From the point of view of Algonquian tribes terms of relationship are linguistic and disseminative phenomena, though in other cases they may be primarily psychological and sociological.

Report of the Annual Meeting: Prepared by the Home Secretary.

This report has appeared in full in SCIENCE.

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SPECIAL ARTICLES

THE SCALES OF THE GONORHYNCHID FISHES

THE Gonorhynchidæ constitute a small family of very peculiar marine fishes of elongate form, found in the seas about Japan, Australia and South Africa. In the Eocene deposits of Wyoming is a fish which Cope named *Notogoneus osculus,* considered to belong to the Gonorhynchidæ. Whitfield in 1890[1] gave an account of a specimen of this species, and expressed the opinion that it belonged in the vicinity of the suckers, or Catostomidæ. It seemed remarkable that a fish from a fresh or brackish water deposit in Wyoming should be referred to a rare marine family of a remote region of the earth; and the scales of *Notogoneus,* admirably figured by Whitfield, did not at all resemble those of the Isospondylous fishes in general, neither had they any resemblance to those of the Catostomidæ. Wishing to apply the more exact methods of comparison of later times, I asked Dr. D. S. Jordan for scales of *Gonorhynchus,* and he has very kindly sent material from *G. abbreviatus* Schlegel, obtained by Alan Owston in the Yokohama (Misaki) market, Japan. These scales wholly confirm the reference of *Notogoneus* to the Gonorhynchidæ, and afford a remarkable illustration of the constancy of scale-structure through millions of years and migrations over the earth. The long parallel-sided scales of *G. abbreviatus* are narrower than those of *N. osculus,* and the truncate base is crenulate, but the peculiar structure is entirely the same. The apical margin has a single row of 18 or fewer (never so many as in *N. osculus*) teeth, which are long and stout, and connected by a thin lamina. Just below these is a broad sculptureless band, the same in living and fossil forms. The lateral circuli are strictly longitudinal and not very dense. Spreading fan-like from the subapical nucleus are the radii (about 12), closely set, with longitudinal bands of curved lines, derived from the system of circuli, between them.

Jordan and Snyder[2] say of *G. abbreviatus:*

> Mr. E. C. Starks has examined the shoulder girdle of this species; it has the mesocoracoid arch, as usual with Isospondylous fishes. Its place is apparently with the earliest and most generalized of these forms.

The scales, however, are more like those of Acanthopterygians. Coming to details of structure, we find a striking resemblance to the scales of *Aphredoderus,* of which genus Jordan says: "Probably the most primitive of all living Percoid fishes, showing affinities with the Salmopercæ" (to which group Regan has more recently referred it). *Aphredoderus* has the same type of marginal teeth, though there is no hyaline band beneath them and the radii are few. Marginal teeth of the same type are found in another group, little related to *Aphredoderus* or *Gonorhynchus;* namely, the Characiform genus *Distichodus* of the fresh waters of tropical Africa. The rest of the *Distichodus* scale shows no close resemblance to that of *Gonorhynchus.*

We have, then, evidence of the extreme constancy of scale characters, even minute details, in the Gonorhynchidæ. On the other hand, the most striking feature of the Gonorhynchid pattern appears, not in the presumed allies of that family, but in other families supposed to be very far removed from it. Is this wholly a matter of independent evolution,

[1] *Bull. Amer. Mus. Nat. His.,* III., p. 117.

[2] Smithsonian Misc. Coll., 45 (1904), p. 236.